

# Robert J Lefkowitz

## List of Publications by Year in descending order

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155  
papers

42,738  
citations

3874

91  
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9346

148  
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157  
all docs

157  
docs citations

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times ranked

23243  
citing authors

| #  | ARTICLE   | IF   | CITATIONS |
|----|---|------|-----------|
| 1  | Seven-transmembrane receptors. <i>Nature Reviews Molecular Cell Biology</i> , 2002, 3, 639-650.   | 16.1 | 2,357     |
| 2  | Transduction of Receptor Signals by $\beta$ -Arrestins. <i>Science</i> , 2005, 308, 512-517.  | 6.0  | 1,570     |
| 3  | Cloning of the gene and cDNA for mammalian $\beta^2$ -adrenergic receptor and homology with rhodopsin. <i>Nature</i> , 1986, 321, 75-79.  | 13.7 | 1,284     |
| 4  | $\beta^2$ -Arrestins and Cell Signaling. <i>Annual Review of Physiology</i> , 2007, 69, 483-510.  | 5.6  | 1,277     |
| 5  | Turning off the signal: desensitization of $\beta^2$ -adrenergic receptor function. <i>FASEB Journal</i> , 1990, 4, 2881-2889.  | 0.2  | 1,209     |
| 6  | G PROTEIN-COUPLED RECEPTOR KINASES. <i>Annual Review of Biochemistry</i> , 1998, 67, 653-692.   | 5.0  | 1,194     |
| 7  | Switching of the coupling of the $\beta^2$ -adrenergic receptor to different G proteins by protein kinase A. <i>Nature</i> , 1997, 390, 88-91.  | 13.7 | 1,176     |
| 8  | Enhanced Morphine Analgesia in Mice Lacking $\beta$ -Arrestin 2. <i>Science</i> , 1999, 286, 2495-2498.   | 6.0  | 953       |
| 9  | The role of $\beta$ -arrestins in the termination and transduction of G-protein-coupled receptor signals. <i>Journal of Cell Science</i> , 2002, 115, 455-465.  | 1.2  | 935       |
| 10 | Seven-transmembrane-spanning receptors and heart function. <i>Nature</i> , 2002, 415, 206-212.  | 13.7 | 862       |
| 11 | $\beta^4$ -Opioid receptor desensitization by $\beta^2$ -arrestin-2 determines morphine tolerance but not dependence. <i>Nature</i> , 2000, 408, 720-723.   | 13.7 | 834       |
| 12 | The role of beta-arrestins in the termination and transduction of G-protein-coupled receptor signals. <i>Journal of Cell Science</i> , 2002, 115, 455-65.   | 1.2  | 780       |
| 13 | Molecular mechanisms of receptor desensitization using the $\beta^2$ -adrenergic receptor-coupled adenylate cyclase system as a model. <i>Nature</i> , 1985, 317, 124-129.  | 13.7 | 758       |
| 14 | beta -Arrestin 2: A Receptor-Regulated MAPK Scaffold for the Activation of JNK3. , 2000, 290, 1574-1577.  |      | 752       |
| 15 | Teaching old receptors new tricks: biasing seven-transmembrane receptors. <i>Nature Reviews Drug Discovery</i> , 2010, 9, 373-386.  | 21.5 | 724       |
| 16 | $\beta^2$ -Arrestin-dependent, G Protein-independent ERK1/2 Activation by the $\beta^2$ Adrenergic Receptor. <i>Journal of Biological Chemistry</i> , 2006, 281, 1261-1273.   | 1.6  | 651       |
| 17 | $\beta^2$ -arrestin-mediated receptor trafficking and signal transduction. <i>Trends in Pharmacological Sciences</i> , 2011, 32, 521-533.   | 4.0  | 628       |
| 18 | Independent $\beta$ -arrestin 2 and G protein-mediated pathways for angiotensin II activation of extracellular signal-regulated kinases 1 and 2. <i>Proceedings of the National Academy of Sciences of the United States of America</i> , 2003, 100, 10782-10787. | 3.3  | 620       |

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|----|--|------|-----------|
| 19 | The genomic clone G-21 which resembles a $\beta^2$ -adrenergic receptor sequence encodes the 5-HT <sub>1A</sub> receptor. <i>Nature</i> , 1988, 335, 358-360.  | 13.7 | 611       |
| 20 | The $\beta^2$ -adrenergic receptor interacts with the Na <sup>+</sup> /H <sup>+</sup> -exchanger regulatory factor to control Na <sup>+</sup> /H <sup>+</sup> exchange. <i>Nature</i> , 1998, 392, 626-630.            | 13.7 | 566       |
| 21 | Receptor-tyrosine-kinase- and G $\beta\gamma$ -mediated MAP kinase activation by a common signalling pathway. <i>Nature</i> , 1995, 376, 781-784.  | 13.7 | 554       |
| 22 | A unique mechanism of $\beta^2$ -blocker action: Carvedilol stimulates $\beta^2$ -arrestin signaling. <i>Proceedings of the National Academy of Sciences of the United States of America</i> , 2007, 104, 16657-16662. | 3.3  | 545       |
| 23 | Cross-talk between cellular signalling pathways suggested by phorbol-ester-induced adenylate cyclase phosphorylation. <i>Nature</i> , 1987, 327, 67-70.  | 13.7 | 538       |
| 24 | Molecular Mechanism of $\beta^2$ -Arrestin-Biased Agonism at Seven-Transmembrane Receptors. <i>Annual Review of Pharmacology and Toxicology</i> , 2012, 52, 179-197.   | 4.2  | 536       |
| 25 | Distinct Phosphorylation Sites on the $\beta^2$ Adrenergic Receptor Establish a Barcode That Encodes Differential Functions of $\beta^2$ -Arrestin. <i>Science Signaling</i> , 2011, 4, ra51.                          | 1.6  | 535       |
| 26 | Biased signalling: from simple switches to allosteric microprocessors. <i>Nature Reviews Drug Discovery</i> , 2018, 17, 243-260.   | 21.5 | 524       |
| 27 | An intronless gene encoding a potential member of the family of receptors coupled to guanine nucleotide regulatory proteins. <i>Nature</i> , 1987, 329, 75-79.   | 13.7 | 513       |
| 28 | $\beta^2$ -arrestin- but not G protein-mediated signaling by the $\epsilon$ -receptor CXCR7. <i>Proceedings of the National Academy of Sciences of the United States of America</i> , 2010, 107, 628-632.              | 3.3  | 499       |
| 29 | Protein kinases that phosphorylate activated G protein-coupled receptors. <i>FASEB Journal</i> , 1995, 9, 175-182.   | 0.2  | 494       |
| 30 | Activation of the cloned muscarinic potassium channel by G protein $\beta\gamma$ subunits. <i>Nature</i> , 1994, 370, 143-146.   | 13.7 | 484       |
| 31 | Role of c-Src Tyrosine Kinase in G Protein-coupled Receptor and G $\beta\gamma$ Subunit-mediated Activation of Mitogen-activated Protein Kinases. <i>Journal of Biological Chemistry</i> , 1996, 271, 19443-19450.     | 1.6  | 483       |
| 32 | Therapeutic potential of $\beta^2$ -arrestin- and G protein-biased agonists. <i>Trends in Molecular Medicine</i> , 2011, 17, 126-139.  | 3.5  | 469       |
| 33 | Differential Kinetic and Spatial Patterns of $\beta^2$ -Arrestin and G Protein-mediated ERK Activation by the Angiotensin II Receptor. <i>Journal of Biological Chemistry</i> , 2004, 279, 35518-35525.                | 1.6  | 455       |
| 34 | GPCR-G Protein- $\beta^2$ -Arrestin Super-Complex Mediates Sustained G Protein Signaling. <i>Cell</i> , 2016, 166, 907-919.  | 13.5 | 443       |
| 35 | Removal of phosphorylation sites from the $\beta^2$ -adrenergic receptor delays onset of agonist-promoted desensitization. <i>Nature</i> , 1988, 333, 370-373.   | 13.7 | 439       |
| 36 | Visualization of arrestin recruitment by a G-protein-coupled receptor. <i>Nature</i> , 2014, 512, 218-222.   | 13.7 | 433       |

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|----|--|------|-----------|
| 37 | Physiological effects of inverse agonists in transgenic mice with myocardial overexpression of the $\beta_2$ -adrenoceptor. <i>Nature</i> , 1995, 374, 272-276.  | 13.7 | 431       |
| 38 | Distinct $\beta$ -Arrestin- and G Protein-dependent Pathways for Parathyroid Hormone Receptor-stimulated ERK1/2 Activation. <i>Journal of Biological Chemistry</i> , 2006, 281, 10856-10864.   | 1.6  | 422       |
| 39 | $\beta_2\beta_3$ Subunits Mediate Src-dependent Phosphorylation of the Epidermal Growth Factor Receptor. <i>Journal of Biological Chemistry</i> , 1997, 272, 4637-4644.  | 1.6  | 420       |
| 40 | Classical and new roles of $\beta$ -arrestins in the regulation of G-PROTEIN-COUPLED receptors. <i>Nature Reviews Neuroscience</i> , 2001, 2, 727-733.   | 4.9  | 413       |
| 41 | $\beta$ -Arrestin-mediated $\beta_1$ -adrenergic receptor transactivation of the EGFR confers cardioprotection. <i>Journal of Clinical Investigation</i> , 2007, 117, 2445-2458.   | 3.9  | 405       |
| 42 | Distinct Pathways of Gi- and Gq-mediated Mitogen-activated Protein Kinase Activation. <i>Journal of Biological Chemistry</i> , 1995, 270, 17148-17153.   | 1.6  | 397       |
| 43 | Structure of active $\beta$ -arrestin-1 bound to a G-protein-coupled receptor phosphopeptide. <i>Nature</i> , 2013, 497, 137-141.  | 13.7 | 393       |
| 44 | Emerging paradigms of $\beta$ -arrestin-dependent seven transmembrane receptor signaling. <i>Trends in Biochemical Sciences</i> , 2011, 36, 457-469.   | 3.7  | 380       |
| 45 | Historical review: A brief history and personal retrospective of seven-transmembrane receptors. <i>Trends in Pharmacological Sciences</i> , 2004, 25, 413-422.   | 4.0  | 363       |
| 46 | Keeping G Proteins at Bay: A Complex Between G Protein-Coupled Receptor Kinase 2 and Gbetagamma. <i>Science</i> , 2003, 300, 1256-1262.  | 6.0  | 361       |
| 47 | A stress response pathway regulates DNA damage through $\beta_2$ -adrenoreceptors and $\beta$ -arrestin-1. <i>Nature</i> , 2011, 477, 349-353.   | 13.7 | 360       |
| 48 | $\beta$ -Arrestin Scaffolding of the ERK Cascade Enhances Cytosolic ERK Activity but Inhibits ERK-mediated Transcription following Angiotensin AT1a Receptor Stimulation. <i>Journal of Biological Chemistry</i> , 2002, 277, 9429-9436.               | 1.6  | 345       |
| 49 | Quantifying Ligand Bias at Seven-Transmembrane Receptors. <i>Molecular Pharmacology</i> , 2011, 80, 367-377.   | 1.0  | 341       |
| 50 | Functional antagonism of different G protein-coupled receptor kinases for $\beta$ -arrestin-mediated angiotensin II receptor signaling. <i>Proceedings of the National Academy of Sciences of the United States of America</i> , 2005, 102, 1442-1447. | 3.3  | 318       |
| 51 | The Stability of the G Protein-coupled Receptor- $\beta$ -Arrestin Interaction Determines the Mechanism and Functional Consequence of ERK Activation. <i>Journal of Biological Chemistry</i> , 2003, 278, 6258-6267.                                   | 1.6  | 316       |
| 52 | Isoprenylation in regulation of signal transduction by G-protein-coupled receptor kinases. <i>Nature</i> , 1992, 359, 147-150.   | 13.7 | 310       |
| 53 | Identification, Quantification, and Localization of mRNA for Three Distinct $\alpha_1$ Adrenergic Receptor Subtypes in Human Prostate. <i>Journal of Urology</i> , 1993, 150, 546-551.   | 0.2  | 310       |
| 54 | Different G protein-coupled receptor kinases govern G protein and $\beta$ -arrestin-mediated signaling of V2 vasopressin receptor. <i>Proceedings of the National Academy of Sciences of the United States of America</i> , 2005, 102, 1448-1453.      | 3.3  | 298       |

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|----|--|------|-----------|
| 55 | Allosteric nanobodies reveal the dynamic range and diverse mechanisms of G-protein-coupled receptor activation. <i>Nature</i> , 2016, 535, 448-452.  | 13.7 | 290       |
| 56 | Distinct conformations of GPCR $\beta$ -arrestin complexes mediate desensitization, signaling, and endocytosis. <i>Proceedings of the National Academy of Sciences of the United States of America</i> , 2017, 114, 2562-2567.   | 3.3  | 281       |
| 57 | New Roles for $\beta$ -Arrestins in Cell Signaling: Not Just for Seven-Transmembrane Receptors. <i>Molecular Cell</i> , 2006, 24, 643-652.   | 4.5  | 273       |
| 58 | $\beta$ -arrestins: traffic cops of cell signaling. <i>Current Opinion in Cell Biology</i> , 2004, 16, 162-168.  | 2.6  | 269       |
| 59 | A region of adenylyl cyclase 2 critical for regulation by G protein beta gamma subunits. <i>Science</i> , 1995, 268, 1166-1169.  | 6.0  | 261       |
| 60 | Recent developments in biased agonism. <i>Current Opinion in Cell Biology</i> , 2014, 27, 18-24.   | 2.6  | 247       |
| 61 | Structure of the M2 muscarinic receptor $\beta$ -arrestin complex in a lipid nanodisc. <i>Nature</i> , 2020, 579, 297-302.   | 13.7 | 238       |
| 62 | $\beta$ -Arrestin-biased Agonism at the $\beta$ -Adrenergic Receptor. <i>Journal of Biological Chemistry</i> , 2008, 283, 5669-5676.   | 1.6  | 226       |
| 63 | A Brief History of G-Protein Coupled Receptors (Nobel Lecture). <i>Angewandte Chemie - International Edition</i> , 2013, 52, 6366-6378.  | 7.2  | 222       |
| 64 | Desensitization, internalization, and signaling functions of $\beta$ -arrestins demonstrated by RNA interference. <i>Proceedings of the National Academy of Sciences of the United States of America</i> , 2003, 100, 1740-1744. | 3.3  | 210       |
| 65 | Light-dependent phosphorylation of rhodopsin by $\beta$ -adrenergic receptor kinase. <i>Nature</i> , 1986, 321, 869-872.   | 13.7 | 207       |
| 66 | Identification of the G Protein-coupled Receptor Kinase Phosphorylation Sites in the Human $\beta$ -Adrenergic Receptor. <i>Journal of Biological Chemistry</i> , 1996, 271, 13796-13803.  | 1.6  | 205       |
| 67 | Angiotensin Analogs with Divergent Bias Stabilize Distinct Receptor Conformations. <i>Cell</i> , 2019, 176, 468-478.e11.   | 13.5 | 194       |
| 68 | Protein Kinase A-mediated Phosphorylation of the $\beta$ -Adrenergic Receptor Regulates Its Coupling to Gs and Gi. <i>Journal of Biological Chemistry</i> , 2002, 277, 31249-31256.  | 1.6  | 175       |
| 69 | Manifold roles of $\beta$ -arrestins in GPCR signaling elucidated with siRNA and CRISPR/Cas9. <i>Science Signaling</i> , 2018, 11, .   | 1.6  | 169       |
| 70 | Molecular mechanism of biased signaling in a prototypical G protein-coupled receptor. <i>Science</i> , 2020, 367, 881-887.   | 6.0  | 168       |
| 71 | $\beta$ -Arrestin-2 regulates the development of allergic asthma. <i>Journal of Clinical Investigation</i> , 2003, 112, 566-574.   | 3.9  | 166       |
| 72 | Dancing with Different Partners: Protein Kinase A Phosphorylation of Seven Membrane-Spanning Receptors Regulates Their G Protein-Coupling Specificity. <i>Molecular Pharmacology</i> , 2002, 62, 971-974.                        | 1.0  | 162       |

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|----|--|------|-----------|
| 73 | Reciprocal Regulation of Angiotensin Receptor-activated Extracellular Signal-regulated Kinases by $\hat{I}^2$ -Arrestins 1 and 2. <i>Journal of Biological Chemistry</i> , 2004, 279, 7807-7811.                         | 1.6  | 157       |
| 74 | Constitutive Protease-activated Receptor-2-mediated Migration of MDA MB-231 Breast Cancer Cells Requires Both $\hat{I}^2$ -Arrestin-1 and -2. <i>Journal of Biological Chemistry</i> , 2004, 279, 55419-55424.           | 1.6  | 155       |
| 75 | Angiotensin and biased analogs induce structurally distinct active conformations within a GPCR. <i>Science</i> , 2020, 367, 888-892.   | 6.0  | 150       |
| 76 | Mechanism of intracellular allosteric $\hat{I}^2$ AR antagonist revealed by X-ray crystal structure. <i>Nature</i> , 2017, 548, 480-484.   | 13.7 | 148       |
| 77 | Conformational Basis of G Protein-Coupled Receptor Signaling Versatility. <i>Trends in Cell Biology</i> , 2020, 30, 736-747.   | 3.6  | 147       |
| 78 | Distinctive Activation Mechanism for Angiotensin Receptor Revealed by a Synthetic Nanobody. <i>Cell</i> , 2019, 176, 479-490.e12.  | 13.5 | 143       |
| 79 | Structure of an endosomal signaling GPCR-G protein- $\hat{I}^2$ -arrestin megacomplex. <i>Nature Structural and Molecular Biology</i> , 2019, 26, 1123-1131.   | 3.6  | 139       |
| 80 | Activation-dependent Conformational Changes in $\hat{I}^2$ -Arrestin 2. <i>Journal of Biological Chemistry</i> , 2004, 279, 55744-55753.   | 1.6  | 135       |
| 81 | Pharmacological Characterization of Membrane-Expressed Human Trace Amine-Associated Receptor 1 (TAAR1) by a Bioluminescence Resonance Energy Transfer cAMP Biosensor. <i>Molecular Pharmacology</i> , 2008, 74, 585-594. | 1.0  | 135       |
| 82 | Intracoronary Adenovirus-Mediated Delivery and Overexpression of the $\hat{I}^2$ -Adrenergic Receptor in the Heart. <i>Circulation</i> , 2000, 101, 408-414.   | 1.6  | 133       |
| 83 | Differential regulation of the $\hat{I}^2$ -adrenergic receptor by Na <sup>+</sup> and guanine nucleotides. <i>Nature</i> , 1980, 288, 709-711.  | 13.7 | 123       |
| 84 | The Active Conformation of $\hat{I}^2$ -Arrestin1. <i>Journal of Biological Chemistry</i> , 2007, 282, 21370-21381.  | 1.6  | 121       |
| 85 | Regulation of $\hat{I}^2$ -Adrenergic Receptor Function by Conformationally Selective Single-Domain Intrabodies. <i>Molecular Pharmacology</i> , 2014, 85, 472-481.  | 1.0  | 121       |
| 86 | Allosteric $\beta$ -blocker isolated from a DNA-encoded small molecule library. <i>Proceedings of the National Academy of Sciences of the United States of America</i> , 2017, 114, 1708-1713.                           | 3.3  | 118       |
| 87 | Pure $\hat{I}^2$ -adrenergic receptor: the single polypeptide confers catecholamine responsiveness to adenylate cyclase. <i>Nature</i> , 1983, 306, 562-566.   | 13.7 | 117       |
| 88 | A role for Ni in the hormonal stimulation of adenylate cyclase. <i>Nature</i> , 1985, 318, 293-295.  | 13.7 | 107       |
| 89 | Divergent Transducer-specific Molecular Efficacies Generate Biased Agonism at a G Protein-coupled Receptor (GPCR). <i>Journal of Biological Chemistry</i> , 2014, 289, 14211-14224.                                      | 1.6  | 105       |
| 90 | ACTH-RECEPTOR INTERACTION IN THE ADRENAL: A MODEL FOR THE INITIAL STEP IN THE ACTION OF HORMONES THAT STIMULATE ADENYL CYCLASE. <i>Annals of the New York Academy of Sciences</i> , 1971, 185, 195-209.                  | 1.8  | 104       |

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|-----|---|------|-----------|
| 91  | Turned on to ill effect. <i>Nature</i> , 1993, 365, 603-604.  | 13.7 | 101       |
| 92  | β <sub>2</sub> -Arrestin-2 regulates the development of allergic asthma. <i>Journal of Clinical Investigation</i> , 2003, 112, 566-574.   | 3.9  | 99        |
| 93  | Chronic guanethidine treatment increases cardiac β <sub>2</sub> -adrenergic receptors. <i>Nature</i> , 1978, 273, 240-242.  | 13.7 | 89        |
| 94  | Phosphorylation of β <sub>2</sub> -Arrestin2 Regulates Its Function in Internalization of β <sub>2</sub> -Adrenergic Receptors. <i>Biochemistry</i> , 2002, 41, 10692-10699.  | 1.2  | 87        |
| 95  | Augmentation of Cardiac Contractility Mediated by the Human β <sub>3</sub> -Adrenergic Receptor Overexpressed in the Hearts of Transgenic Mice. <i>Circulation</i> , 2001, 104, 2485-2491.  | 1.6  | 85        |
| 96  | β <sub>2</sub> -Arrestin-mediated Signaling Regulates Protein Synthesis. <i>Journal of Biological Chemistry</i> , 2008, 283, 10611-10620.   | 1.6  | 84        |
| 97  | Mechanism of β <sub>2</sub> AR regulation by an intracellular positive allosteric modulator. <i>Science</i> , 2019, 364, 1283-1287.   | 6.0  | 82        |
| 98  | β <sub>2</sub> -Arrestin Deficiency Protects Against Pulmonary Fibrosis in Mice and Prevents Fibroblast Invasion of Extracellular Matrix. <i>Science Translational Medicine</i> , 2011, 3, 74ra23.  | 5.8  | 81        |
| 99  | Stable Interaction between β <sub>2</sub> -Arrestin 2 and Angiotensin Type 1A Receptor Is Required for β <sub>2</sub> -Arrestin 2-mediated Activation of Extracellular Signal-regulated Kinases 1 and 2. <i>Journal of Biological Chemistry</i> , 2004, 279, 48255-48261. | 1.6  | 76        |
| 100 | Small-Molecule Positive Allosteric Modulators of the β <sub>2</sub> -Adrenoceptor Isolated from DNA-Encoded Libraries. <i>Molecular Pharmacology</i> , 2018, 94, 850-861.   | 1.0  | 66        |
| 101 | Discovery of β <sub>2</sub> Adrenergic Receptor Ligands Using Biosensor Fragment Screening of Tagged Wild-Type Receptor. <i>ACS Medicinal Chemistry Letters</i> , 2013, 4, 1005-1010.   | 1.3  | 65        |
| 102 | Conformationally selective RNA aptamers allosterically modulate the β <sub>2</sub> -adrenoceptor. <i>Nature Chemical Biology</i> , 2016, 12, 709-716.   | 3.9  | 65        |
| 103 | β <sub>2</sub> -Arrestin2 Couples Metabotropic Glutamate Receptor 5 to Neuronal Protein Synthesis and Is a Potential Target to Treat Fragile X. <i>Cell Reports</i> , 2017, 18, 2807-2814.  | 2.9  | 60        |
| 104 | Sortase ligation enables homogeneous GPCR phosphorylation to reveal diversity in β <sub>2</sub> -arrestin coupling. <i>Proceedings of the National Academy of Sciences of the United States of America</i> , 2018, 115, 3834-3839.  | 3.3  | 57        |
| 105 | Allosteric Modulation of β <sub>2</sub> -Arrestin-biased Angiotensin II Type 1 Receptor Signaling by Membrane Stretch. <i>Journal of Biological Chemistry</i> , 2014, 289, 28271-28283.   | 1.6  | 55        |
| 106 | Arrestins Come of Age. <i>Progress in Molecular Biology and Translational Science</i> , 2013, 118, 3-18.  | 0.9  | 50        |
| 107 | Regulation of the β <sub>2</sub> -adrenergic receptor and its mRNA in the rat ventral prostate by testosterone. <i>FEBS Letters</i> , 1988, 233, 173-176.   | 1.3  | 49        |
| 108 | Palmitoylation Increases the Kinase Activity of the G Protein-Coupled Receptor Kinase, GRK6. <i>Biochemistry</i> , 1998, 37, 16053-16059.   | 1.2  | 48        |

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|-----|---|------|-----------|
| 109 | G protein-coupled receptor kinases (GRKs) orchestrate biased agonism at the $\beta_2$ -adrenergic receptor. <i>Science Signaling</i> , 2018, 11, .  | 1.6  | 47        |
| 110 | GPCR-mediated $\beta_2$ -arrestin activation deconvoluted with single-molecule precision. <i>Cell</i> , 2022, 185, 1661-1675.e16.   | 13.5 | 43        |
| 111 | Introduction to Special Section on $\beta_2$ -Arrestins. <i>Annual Review of Physiology</i> , 2007, 69, .   | 5.6  | 42        |
| 112 | $\beta$ -Actinin is a potent regulator of G protein-coupled receptor kinase activity and substrate specificity in vitro. <i>FEBS Letters</i> , 2000, 473, 280-284.  | 1.3  | 39        |
| 113 | Detergent- and phospholipid-based reconstitution systems have differential effects on constitutive activity of G-protein-coupled receptors. <i>Journal of Biological Chemistry</i> , 2019, 294, 13218-13223.  | 1.6  | 38        |
| 114 | $\beta_2$ -arrestin 1 regulates $\beta_2$ -adrenergic receptor-mediated skeletal muscle hypertrophy and contractility. <i>Skeletal Muscle</i> , 2018, 8, 39.  | 1.9  | 37        |
| 115 | Molecular Mechanisms of Coupling in Hormone Receptor-Adenylate Cyclase Systems. <i>Advances in Enzymology and Related Areas of Molecular Biology</i> , 2006, 53, 1-43.  | 1.3  | 36        |
| 116 | Myocardial G Protein-Coupled Receptor Kinases: Implications for Heart Failure Therapy. <i>Proceedings of the Association of American Physicians</i> , 1999, 111, 399-405.                                     | 2.1  | 35        |
| 117 | Synthetic nanobodies as angiotensin receptor blockers. <i>Proceedings of the National Academy of Sciences of the United States of America</i> , 2020, 117, 20284-20291.                                       | 3.3  | 35        |
| 118 | SnapShot: $\beta_2$ -Arrestin Functions. <i>Cell</i> , 2020, 182, 1362-1362.e1.   | 13.5 | 35        |
| 119 | Altered airway and cardiac responses in mice lacking G protein-coupled receptor kinase 3. <i>American Journal of Physiology - Regulatory Integrative and Comparative Physiology</i> , 1999, 276, R1214-R1221. | 0.9  | 33        |
| 120 | Temperature immutability of adenylyl cyclase-coupled $\beta_2$ adrenergic receptors. <i>Nature</i> , 1974, 249, 258-260.  | 13.7 | 31        |
| 121 | Mechanisms involved in adrenergic receptor desensitization. <i>Biochemical Society Transactions</i> , 1990, 18, 541-544.  | 1.6  | 31        |
| 122 | $\beta_2$ -Adrenoreceptors determine affinity but not intrinsic activity of adenylyl cyclase stimulants. <i>Nature</i> , 1979, 280, 502-504.  | 13.7 | 25        |
| 123 | $\beta_2$ -Arrestin-Biased Allosteric Modulator Potentiates Carvedilol-Stimulated $\beta_2$ Adrenergic Receptor Cardioprotection. <i>Molecular Pharmacology</i> , 2021, 100, 568-579.                         | 1.0  | 24        |
| 124 | Variations on a theme. <i>Nature</i> , 1991, 351, 353-354.  | 13.7 | 22        |
| 125 | Receptor regulation: $\beta_2$ -arrestin moves up a notch. <i>Nature Cell Biology</i> , 2005, 7, 1159-1161.   | 4.6  | 22        |
| 126 | Signaling at the endosome: cryo-EM structure of a GPCR-G protein-beta-arrestin mega-complex. <i>FEBS Journal</i> , 2021, 288, 2562-2569.  | 2.2  | 22        |



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|-----|---|------|-----------|
| 127 | Allosteric activation of proto-oncogene kinase Src by GPCR $\beta$ -arrestin complexes. Journal of Biological Chemistry, 2020, 295, 16773-16784.  | 1.6  | 21        |
| 128 | GPCR signaling: conformational activation of arrestins. Cell Research, 2018, 28, 783-784.   | 5.7  | 20        |
| 129 | Effect of pertussis toxin on $\beta$ -adrenoceptors: decreased formation of the high-affinity state for agonists. FEBS Letters, 1984, 172, 95-98.   | 1.3  | 19        |
| 130 | The $\beta$ -arrestin-biased $\beta$ -adrenergic receptor blocker carvedilol enhances skeletal muscle contractility. Proceedings of the National Academy of Sciences of the United States of America, 2020, 117, 12435-12443.                 | 3.3  | 19        |
| 131 | $\beta$ -Arrestin $\beta$ -Biased Angiotensin II Receptor Agonists for COVID-19. Circulation, 2020, 142, 318-320.   | 1.6  | 19        |
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